AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1-12. (Cancelled)

13. (Currently Amended) A turbine having a combustion system comprising:

a compressor adapted to produce compressed atmospheric air; and

a combustion system for mixing and combusting a fuel injected into the compressed atmospheric air to produce expanding gases;

[[a**]]** said turbine ~~which is~~ being powered by the expanding gases**[[**:**]]**

~~wherein~~ said combustion system ~~comprises~~ comprising:

a first fuel supply to supply fuel to the compressed atmospheric air;

a heat exchanger comprising a catalyst section ~~including~~ comprising a catalyst disposed within said catalyst section, and a cooling tube wherein the compressed air and the fuel flow through said catalyst section and the compressed air flows through the cooling tube; and

a second fuel supply to supply fuel to the compressed atmospheric air after the compressed atmospheric air has passed through said catalyst section.

14. (Currently Amended) The turbine of claim 13, wherein:

~~wherein~~ said catalyst section ~~comprises~~ comprising a plurality of **[[**said**]]** catalyst members, each extending ~~along~~ parallel to a first axis;

~~wherein~~ said ~~heat exchanger~~ cooling tubes further ~~includes~~ comprising a plurality of cooling tubes, each extending ~~along~~ parallel to a second axis generally parallel to said first axis for at least a selected length;

~~wherein~~ said catalyst members **[[**are**]]** arranged to form a plurality of columns spaced ~~transversally~~ transversely to said first axis and defining a plurality of channels; and

~~wherein~~ said cooling tubes **[[**are**]]** arranged in a plurality of columns and extend a distance along said catalyst members and generally perpendicular to said channels.

15. (Currently Amended) The turbine of claim 14, ~~wherein~~ said catalyst members, said cooling tubes and said channels ~~define~~ defining a flow path for the compressed atmospheric air such that the compressed atmospheric air is adapted to receive thermal energy from said catalyst members by flowing through said channels and said cooling tubes.

16. (Currently Amended) The turbine of claim 14, ~~wherein~~ further comprising:

thermal energy ~~is transferred~~ transfer to the compressed atmospheric air as **[[it]]** the compressed atmospheric air flows through said heat exchanger such that the fuel from the first fuel supply is combusted via said catalyst.

17. (Currently Amended) The turbine of claim 14, further comprising:

a heat exchange area;

a pre-mix area for mixing a first portion of the fuel with the air; and

a main injector area comprising at least one injector for said catalyst ~~tube;~~ members,

wherein:

a second portion of the fuel is mixed with the compressed atmospheric air in said main injector; and

~~wherein~~ said main injector **[[is]]** adapted to mix the second portion of fuel with the compressed atmospheric air such that the temperature throughout the area of the injector is substantially equal.

18. (Currently Amended) The turbine of claim 17, ~~wherein~~ said main injector **[[is]]** operable to inject a fuel, ~~including~~ comprising at least one of a hydrogen, a methane, a natural gas, a carbon based fuel, a Synthesis gas, and combinations thereof.

19. (Currently Amended) The turbine of claim 17, ~~wherein~~ said main injector ~~may inject~~ injecting at least two different fuels at different times with substantially similar results.

20. (Currently Amended) The turbine of claim 17, ~~wherein~~ said at least one injector ~~includes~~ comprising a plurality of injectors, ~~wherein~~ said plurality of injectors substantially **[[**mix**]]** mixing at least one of a methane fuel, a hydrogen fuel, a Synthesis fuel, a natural gas fuel, and combinations thereof with the oxidizer.

21. (Currently Amended) The turbine of claim 13, ~~wherein~~ said catalyst section ~~comprises~~ comprising a catalyst **[[**fin**]]** channel.

22-60. (Cancelled)

61. (New) A combustion system for a turbine, comprising:

a compressor adapted to produce compressed atmospheric air; and

a combustion system for mixing and combusting a fuel injected into the compressed atmospheric air to produce expanding gases;

said turbine being powered by the expanding gases; and

said combustion system comprising:

a first fuel supply to supply fuel to the compressed atmospheric air;

a heat exchanger comprising a catalyst section comprising a catalyst disposed within said catalyst section, wherein the compressed air and the fuel flow through said catalyst section;

a second fuel supply to supply fuel to the compressed atmospheric air after the compressed atmospheric air has passed through said catalyst section;

said catalyst section comprising a plurality of catalyst members, each extending parallel to a first axis;

said heat exchanger further comprising a plurality of cooling tubes, each extending parallel to a second axis generally parallel to said first axis for at least a selected length;

said catalyst members arranged to form a plurality of columns spaced transversely to said first axis and defining a plurality of channels; and

said cooling tubes arranged in a plurality of columns and extend a distance along said catalyst members and generally perpendicular to said channels.

62. (New) The combustion system of claim 61, further comprising:

a second fuel supply to supply fuel to the compressed atmospheric air after the compressed atmospheric air has passed through said catalyst section.

63. (New) The combustion system of claim 61, said catalyst members, said cooling tubes and said channels defining a flow path for the compressed atmospheric air such that the compressed atmospheric air is adapted to receive thermal energy from said catalyst members by flowing through said channels and said cooling tubes.

64. (New) The combustion system of claim 61, further comprising:

thermal energy transfer to the compressed atmospheric air as the compressed atmospheric air flows through said heat exchanger such that the fuel from the first fuel supply is combusted via said catalyst.

65. (New) A combustion system for a turbine, comprising:

a compressor adapted to produce compressed atmospheric air; and

a combustion system for mixing and combusting a fuel injected into the compressed atmospheric air to produce expanding gases;

said turbine being powered by the expanding gases; and

said combustion system comprising:

a first fuel supply to supply fuel to the compressed atmospheric air;

a heat exchanger comprising a catalyst section comprising a catalyst disposed within said catalyst section, wherein the compressed air and the fuel flow through said catalyst section;

a second fuel supply to supply fuel to the compressed atmospheric air after the compressed atmospheric air has passed through said catalyst section; and

said catalyst section comprising a plurality of catalyst members;

said turbine being powered by the expanding gases and further comprising:

a heat exchange area;

a pre-mix area for mixing a first portion of the fuel with the air; and

a main injector area comprising at least one injector for said catalyst members;

a second portion of the fuel being mixed with the compressed atmospheric air in said main injector; and

said main injector adapted to mix the second portion of fuel with the compressed atmospheric air such that the temperature throughout the area of the injector is substantially equal.

66. (New) The combustion system of claim 65, said main injector operable to inject a fuel, comprising at least one of a hydrogen, a methane, a natural gas, a carbon based fuel, a Synthesis gas, and combinations thereof.

67. (New) The combustion system of claim 65, said main injector injecting at least two different fuels at different times with substantially similar results.

68. (New) The combustion system of claim 65, said at least one injector comprising a plurality of injectors, said plurality of injectors substantially mixing at least one of a methane fuel, a hydrogen fuel, a Synthesis fuel, a natural gas fuel, and combinations thereof with the oxidizer.